Prince Sultan University

Department of Mathematics & Physics

PHY 105- General Physics

First Exam

Second Semester, Term 112

Monday 19/3/2012

Examination Time : 60 minutes

Name (Please Print)_____ Student I.D. _____
Section # _____

Important Instructions:

1. You can use a scientific calculator that does not have programming or graphing capabilities.
*2. You may **NOT** borrow a **calculator** from anyone.*
*3. Do not use **RED pen**.*
*4. This is a closed books and notes exam. Do **NOT** use notes or textbooks.*
*5. There should be **NO** talking during the examination.*
*6. Your will be **expelled** immediately from the exam if your mobile phone is seen or heard.*
*7. Any signs of **cheating** may cause you being expelled from the exam.*
*8. This examination has **2 parts**. **Part 1** has **11multiple choice** questions, each question worth **1 point**. **Part 2** has **Two** workout problems each problem worth **3 points.***

Make sure your paper has all the questions and problems.

	Possible Score	**Student's Score**	**Student's Total Score**
Part 1 Questions	**11**	**1 x**	
Part 2: P. # 1	**3**		
P. # 2	**3**		
Total	**17**		**/15**

Part 1: 11 Multiple Choice Questions (1 mark each)

Use g=10 m/s^2

Please read each question carefully then please circle ◯ the correct answer.

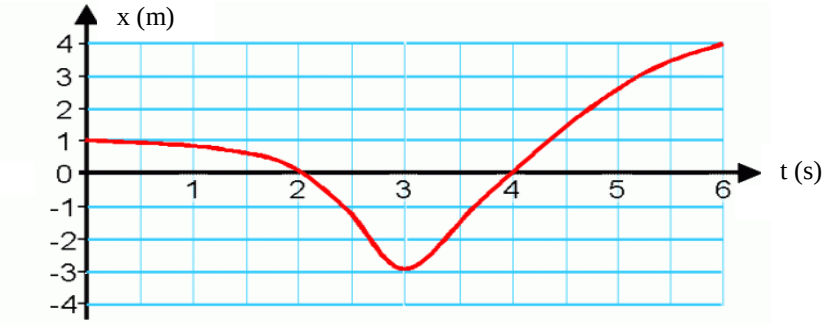
1) The SI unit for acceleration is

a) meters b) seconds c) meters per second

d) meters per second squared e) meters squared per second

2) The shown graph represents the position of a particle as a function of time. What is the average speed of the particle between t = 3 s and t = 6s.

a) 1.5 m/s b) 2.33 m/s c) 7 m/s d) 0.333 m/s e) 0.43 m/s



3) What is the acceleration of a bus that maintains a constant velocity of 70 km/h west for 13 minutes?

a) 0 m/s^2 b) 19.4 m/s^2 c) 6.9 m/s^2 d) 1.5 m/s^2 e) 5.4 m/s^2

4) You drive your car at a speed of 120 km/h for 15 km then at a speed of 100 km/h for 20 km. Your average speed in the overall distance is:

a) 105.2 km/h b) 107.7 km/h c) 112.2 km/h d) 115.6 km/h e) 118.3 km/h

5) If a bike accelerates uniformly from a speed of 2 m/s to a speed of 7 m/s over a distance of 45 m, then the average acceleration of the bike is.

a) 1.2 m/s^2 b) 0.34 m/s^2 c) 0.5 m/s^2 d) 0.72 m/s^2 e) 0.11 m/s^2

6) If a stone is dropped into a deep well and is heard to hit the water 3.4 s after being dropped, then the depth of the well is

a) 29 m b) 12 m c) 17 m d) 58 m e) 41 m

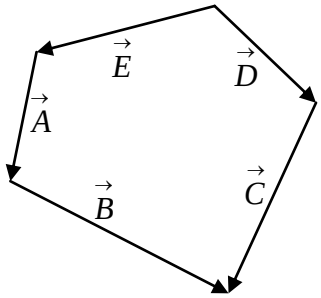
7) If vector $\vec{F} = -8\hat{x} + 15\hat{y}$, then the magnitude and directional angle of $\vec{F}$ are

a) $7,118^o$ b) $17,62^o$ c) $17,118^o$ d) $7,62^o$ e) $23,118^o$

8) If $\vec{A} = 12\hat{x} - 3\hat{y}$ and $\vec{B} = 24\hat{x} + 10\hat{y}$, then the magnitude of the vector $\vec{C} = 3\vec{A} - \vec{B}$ is

a) 22.5 b) 42.8 c) 64.3 d) 90.7 e) 13.1

9) Which of the following is true concerning vectors $\vec{A}$, $\vec{B}$, $\vec{C}$, $\vec{D}$, and $\vec{E}$ shown



a) $\vec{A} + \vec{B} = \vec{C} + \vec{D} + \vec{E}$

b) $\vec{D} + \vec{E} = \vec{A} + \vec{B} + \vec{C}$

c) $\vec{B} + \vec{C} = \vec{A} + \vec{D} + \vec{E}$

d) $\vec{A} + \vec{E} = \vec{C} + \vec{D} + \vec{B}$

e) $\vec{C} + \vec{D} = \vec{A} + \vec{B} + \vec{E}$

10) If the velocity of car A with respect to ground is $11\hat{x} - 24\hat{y}$ m/s and the velocity of car A with respect to car B is $-15\hat{x} + 8\hat{y}$ m/s, what is the velocity of car B with respect to ground?

a) $-4\hat{x} - 32\hat{y}$ m/s b) $26\hat{x} - 32\hat{y}$ m/s c) $-4\hat{x} - 16\hat{y}$ m/s

d) $26\hat{x} - 16\hat{y}$ m/s e) $32\hat{x} - 26\hat{y}$ m/s

11) An airplane flies at a constant speed at a certain height. The pilot drops a heavy package, which falls and strikes the ground. Where, approximately, does the package land?

a) Behind the plane
b) In front of the plane
c) Beneath the plane
d) The answer depends on the speed of the plane
e) More information are needed to decide

Part 2: Solve the following two problems in the space provided in between showing all your steps (3 marks each)

Problem 1: A spear is thrown with an initial velocity of 25 m/s at an angle of 60° above the ground.

a) Calculate the time of flight of the spear?

b) Calculate the range of the throw

Problem 2: A particle starts to move from the origin at t=0 s with a velocity of $19\hat{x} - 10\hat{y}$ m/s and moves in the x-y plane with a constant acceleration of $5\hat{x} - 2\hat{y}$ m/s^2.

a) What is the speed of the particle at t=3s?

b) What is the distance from the origin to the particle at t=3s?